

## ABSTRACT

Provided are compositions and assay kits comprising functionalized nanocrystals having extending therefrom a plurality of polynucleotide strands of known sequence; wherein primary dots are used to operably link to a molecular probe, and secondary dots comprise a plurality of polynucleotide strands which are complementary to the plurality of polynucleotide strands of the primary dots. Also provided is a method for detecting the presence or absence of target molecule in a sample comprising operably linking primary dots to molecular probe, contacting the complex formed with the sample, contacting the sample with successive additions of secondary dots and primary dots. If target molecule is present in the sample, the primary dots and secondary dots will form dendrimers that can be detected by fluorescence emission.